

Tadiran Batteries – the first choice for IoT communication modules

Application example „NeoMesh wireless sensors“



Neocortec is a manufacturer of NeoMesh wireless sensor communication modules used in many IoT solutions. When incorporated with a sensor or an actuator, becoming a node, multiple nodes communicate with each other in a wireless network. NeoMesh complements 5G LPWAN technologies including LTE-M and NB-IOT cloud connected sensors by extending the range of these networks into hard to reach places such as deep indoor or underground. As an example, nodes in the basement or at places without coverage can easily be reached through forming a mesh-net to a node with 5G connectivity.

The modules consist of hardware with a radio on for transmitting and receiving messages, and a protocol stack dictating in what way the modules should be communicating with each other. NeoMesh nodes set up their own wireless network within the license free sub-GHz or at 2.4 GHz bands. The network can be scaled to up to 65,000 nodes as all nodes will participate in forwarding messages between any given nodes.

Today, NeoMesh is used in applications such as home and building automation, industrial automation, alarm and security systems, indoor asset tracking, agricultural and forest monitoring, and many more.

The philosophy behind the NeoMesh is to create a wireless sensor network which is reliable, scalable, and optimized for low power consumption. Many of these small devices are working in hard to reach, remote places without connection to the power grid. As such, customers expect battery operation with lifetime of more than 7 years, in some cases up to decades. Low power consumption is accomplished through putting the nodes to sleep, for then to wake up at synchronized time intervals to send and receive packages. Another design criteria were to make all nodes equal without any

dedicated nodes acting as routers. This creates a balanced power consumption throughout the nodes, without any nodes consuming more power than the other nodes. But of course, this is not the only key to a long lifespan. Selecting the right battery is also important, so that the node can be “forgotten” for many years without any need for attention. An IoT Battery must cope with the environmental conditions of the application in hot and cold temperatures and provide energy for the entire lifespan. Some nodes must withstand cold temperatures typically down to $-40\text{ }^{\circ}\text{C}$ and below, whereas others will be working at the opposite side of the temperature scale. Another consideration is the low power during sleep, and for peak current during data transmission when the nodes are awake.

To cope with all these demands Tadiran invented the PulsesPlus technology combining an Ultra-low self-discharge lithium primary cell with the high-power Hybrid Layer capacitor. While the primary cells will deliver all the energy for the entire lifespan of the product, the HLC delivers the power for radio transmission or other demanding functions. The PulsesPlus technology has been proven to last for decades even in a wide temperature range from -40 to $85\text{ }^{\circ}\text{C}$. The system is completely modular to cover all voltages, lifespan, and power demands. As an optimal partner for a long-lasting SL-860 AA or SL-2880 D cell the new HLC-1020P6 turned out to be a perfect match for most IoT applications. It is small, cost effective and very powerful to handle the relevant radio protocols. PulsesPlus is established, proven and respected starting initially for utility metering worldwide and is equally suited for the growing demands from the internet of things.

 **TADIRAN BATTERIES**
The heart of your device



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